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Indian Standard

METHOD FOR OLFACTORY ASSESSMENT OF NATURAL AND SYNTHETIC PERFUMERY MATERIALS

(*First Revision*)

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NEW DELHI 110002

Gr 3 *November* 1988

Indian Standard

METHOD FOR OLFACTORY ASSESSMENT OF NATURAL AND SYNTHETIC PERFUMERY MATERIALS

(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 10 March 1988, after the draft finalized by the Natural and Synthetic Perfumery Materials Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 This standard was first published in 1963. The Committee responsible for the preparation of this standard felt that it should be revised in view of the trade practices prevailing in perfumery industry and also to make it more comprehensive.

0.3 Natural and synthetic perfumery materials, such as essential oils, aromatic chemicals, etc, are used primarily for their odour appeal. Although the analytical characteristics which are commonly determined may provide some assurance regarding the chemical purity of an odoriferous substance, they do not necessarily indicate the 'purity' of odour. Hence, olfactory evaluation has been practised for centuries and, in the perfumery trade, it has been formed the basis of acceptance or rejection of odoriferous materials. In spite of the importance attached to this subject, there is no uniform method for odour evaluation nor has a standard procedure yet been formulated in any country. This standard was formulated with a view to introduce a uniform method of test for olfactory assessment of natural and synthetic perfumery materials.

0.4 Olfactory assessment has been the target of some criticism as it is a subjective test. Numerous attempts on basic odour research and, more particularly, on objective measurement techniques have been made from time to time but none of these has so far found wide acceptance. Whereas objective methods are the goal of all odour research, there is at present no technique which may replace sensory detection and evaluation of odours.

0.4.1 So far 23 Indian Standards have been published on sensory evaluation (*see* Appendix A).

0.5 In the preparation of this standard, substantial assistance has been derived from the accumulated testing experience of the Indian perfumery soap and cosmetic industries. Assistance has also been derived from various international publications on this subject.

0.6 This standard is a necessary adjunct to all Indian Standard specifications relating to natural and synthetic perfumery materials, such as essential oils, aromatic chemicals, etc. Unless otherwise agreed between the purchaser and the supplier, the purchaser shall have the option to conduct olfactory assessment of the material in accordance with this standard.

1. SCOPE

1.1 This standard prescribes method for olfactory assessment of natural and synthetic perfumery materials based on comparison of a given material with its corresponding standard sample.

2. TERMINOLOGY

2.0 General — For the purpose of this standard, the following definitions shall apply.

2.1 Top Note — The initial and primary odour effect perceived by the olfactory nerves on smelling a strip freshly impregnated with the material being tested. The top note(s) is (are) usually of a short duration and may or may not be co-perceived along with the middle note.

2.2 Middle Note — The secondary overall odour effect experienced by the olfactory nerves on smelling a strip impregnated with the material after the initial top note has evaporated. It lasts for a longer time on the strip than the top note.

2.3 Residual Note (Dry-Out Note) — The tertiary odour effect experienced by olfactory nerves on smelling a strip impregnated with a material after the top and the middle notes have disappeared. Besides indicating the lasting character and strength of the material, it may also reveal the nature of the lesser volatile materials.

2.4 By-Note — An odour effect, additional to the normal pattern of odours associated with the material, experienced by olfactory nerves on smelling an impregnated strip during any stage of evaporation. It is generally regarded as an index of foreign odour and/or undesirable adulterant and alien.

2.5 Odour Description — Due to the absence of precise terms, descriptive words which are subjective in nature are commonly used to express the odour sensations perceived in the top, middle, residual and by-notes. Some of these terms are given below but the list is not intended to be exhaustive:

acid
acrid
aldehydic
amber
animal

Balsamic
bitter
burnt

camphoraceous
choking
citrus
cloying
cool

dry
dull

earthy
exalting

faecal
fatty
fishy
floral
fungal
fresh
fruity

goaty
grassy
green

heavy
herbal
honey

intense

leafy
leathery

minty
mossy
mushroomy
musky
musty

nauseating
nutty

oriental

peppery
persistent
phenolic
piney
powdery
pungent

refreshing

sappy
sharp
sickly
smoky
sour
spicy
stem like
still odour
sulphuraceous
sultry
sweet

tarry
tart

woody

3. REQUIREMENTS

3.1 General Requirements — The following general precautions are required to be noted.

3.1.1 *Selection and Training* — Better results are obtained if individuals with a keen sense of smell and ability to distinguish between different odours are selected for training in olfactory assessment.

3.1.2 *Fatigue* — Continuous smelling causes olfactory fatigue and decreases critical odour perception. To avoid this, the number of samples assessed during a session should be limited as far as is practical. Further, during smelling, the body should be relaxed. Resting for an interval between smelling different samples is also advantageous. If the number of samples to be tested is fairly large, it is advisable to examine last those materials which are known to be pungent or strong in odour.

It should be borne in mind that inability to correctly identify certain odours may arise from natural deficiencies such as specific anosmia. For instance, some people are unable to percieve musky odour.

3.1.3 *Bias* — The necessity of minimizing all differences between samples other than that of odour in order to prevent the prejudicing of results is stressed. 'Blind' tests should be conducted by ensuring that the markings on the smelling strip do not dislodge the origin of the samples.

3.1.4 *Time of Olfactory Assessment* — The evidence relating to the most favourable time for conducting olfactory assessment is somewhat conflicting. However, the morning appears to be generally favoured. In general olfactory assessment should be done after a reasonable interval of time has elapsed after a meal or a beverage has been taken.

3.1.5 *Freedom from Contaminating Odours* — It is necessary to ensure that the hands, nose and smelling strips are free from contaminating odours as these are likely to vitiate the results. It is recommended that the individual responsible for assessing odour should wash his/her hands several times during a smelling session as well as clear his/her nose.

3.2 Material Requirements — The following materials, apparatus and environmental conditions are required.

3.2.1 *Library of Standard Samples* — For each essential oil, aromatic chemical or other perfumery material, there shall be a standard sample of approved odour value as agreed upon by the purchaser and the supplier. The standard samples shall be kept in well-stoppered, air-tight, neutral amber-coloured glass bottles and when not in use, they shall be stored in a refrigerator at about 5°C.

3.2.1.1 The odour characteristics of standard samples are likely to change over a period of time however well they may be stored. Some materials improve in odour as a result of maturing while others deteriorate because of minute oxidative changes. An alteration in the odour characteristics of standard samples is not desirable and, in such cases, fresh standards should be adopted. Generally, all perfumery materials have recommended shelf life and the sample should be changed thereafter.

3.2.2 *Ethyl Alcohol* — Perfumery grade (conforming to IS : 1049-1962*).

3.2.3 *Diethyl Phthalate* — Perfumery grade.

3.2.4 *Smelling Strips* — These shall preferably be 1 cm wide and 15 cm long. They shall be made from odourless, thin, absorbent paper and shall be sufficiently stiff so that the strips do not bend under their own weight when held in a horizontal position.

NOTE — Although it is not within the purview of this standard to prescribe specifications for paper used for making smelling strips, it may be noted that absorbent paper of substance ranging from 100 to 280 g/m^2 is commonly used. The paper is made entirely from the best cotton material, and is usually in the form of cotton or linen fibre or a mixture of both. It should be free from any trace of chemicals. Also the water used in making such paper should be pure and completely free from odours, chemicals or salts. The paper should be neutral and should have been kept away from odorous materials and environment all the time. These considerations should be useful in evaluating the quality of the paper used for preparing smelling strips.

3.2.4.1 Smelling strips shall be packed in air-tight, odour-free containers and stored in a clean odour-free room. Those intended for daily use shall preferably be kept in a wide-mouthed glass bottle covered by a beaker.

3.2.5 *Strip Stand* — A cruciform patterned 3-clip stand, approximately 21 cm high, or any other suitable device, to hold impregnated smelling strips as shown in Fig. 1.

3.2.6 *Environment* — A well-ventilated room, as free as possible from all outside disturbances. Ideally, the temperature and humidity suited are about 20°C and 80 percent RH, respectively. The colouring of the room shall be sober and the furnishing restricted. The general environment shall have a restful rather than a distracting effect.

4. PROCEDURE

4.1 One end of each smelling strip shall be clearly marked before use. Dip the unmarked end of one strip (about 0·5 to 1·0 cm) in the material under examination and of another strip to the same depth in the standard sample after it has attained room temperature. For certain perfumery materials, such as fatty aldehydes, absolutes and solids, use 1 to 10 percent solutions in ethyl alcohol or diethyl phthalate for olfactory assessment.

4.1.1 For semi-solids, solids and strong-smelling substances, use the procedure as given below.

4.1.1.1 *For semi-solid materials* — The odour of semi-solid materials such as guaiacwood oil, oakmoss resinoid and absolute, latdenum resinoid and absolute, etc, should be taken on smelling strips but only after melting the contents completely under controlled temperature below 100°C preferably on water-bath.

4.1.1.2 *For solid materials* — The odour of solid materials, such as coumarin, musk ambrette, etc, should be examined after pouring out some quantity (about 5 g) on odour-free non-absorbent paper (such as glassine). Solids should be smelt both as such, as well as after crushing to enable the occluded impurities to be perceived more easily.

4.1.1.3 *For strong-smelling materials* — In order to have a better perception, strong smelling substances irrespective of their physical appearance may also be smelt after dilution to about 1 to 10 percent such as indole, fatty aldehydes, etc, using ethanol or diethylphthalate as a diluent.

4.2 Hold the strip impregnated with the standard sample at such a distance from the nose that there is incipient yet distinct perception of odour. While smelling, concentrate wholly on the sensations received and make mental observations. Repeat the procedure with the strip impregnated

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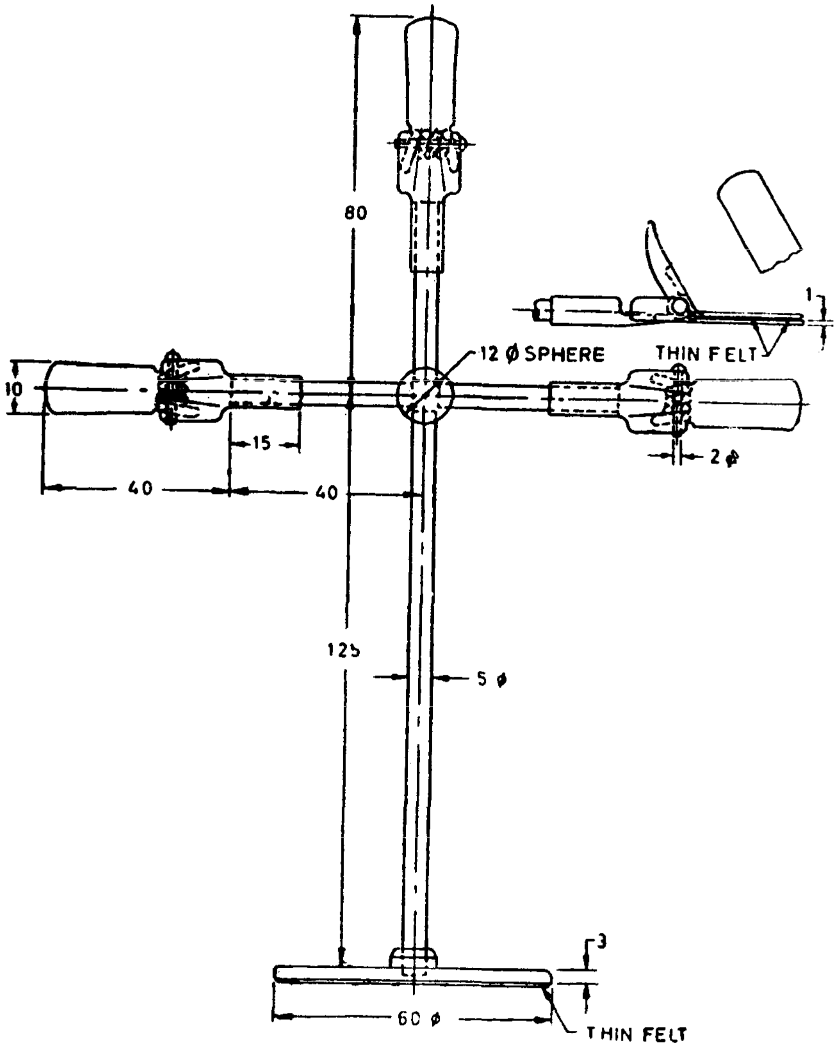
*Specification for alcohol, perfumary grade (*revised*).



All dimensions in millimetres.

FIG. 1 STRIP STAND

with the test sample. After about a minute's rest, repeat the comparison reversing the order of smelling the two strips. Finally, compare the two strips for their odour in a 'blind' test. If a difference in odour is observed, repeat the 'blind' test on the two strips five times. Record the observations of each 'blind' test.

4.2.1 It is important to note that although the room shall be well-ventilated, the strips kept under examination should not be exposed to a direct draught.

4.3 After this initial assessment for top notes, fix the two strips on a stand keeping them sufficiently apart to avoid inter-contamination. Examine the strips periodically by the 'blind' test and note the changes in quality and intensity of odour. Continue in this manner as long as the odour on each strip remains perceptible.

5. REPORT

5.1 Report the top, middle and residual odour assessment of the test sample as compared with the odour of the standard sample at corresponding stages of assessment.

5.2 Criterion for Judgement of Quality — The odour of the material under examination shall correspond to that of the standard at all stages of assessment. If it does not and the pattern of odour is considered to be inferior to that of the standard, the quality of the material shall be regarded as not satisfactory.

5.3 Referee Test — In case of dispute, present the individual assessing odour with three suitably coded smelling strips, two of which have been dipped in the material under examination and the remaining one in the standard sample (or *vice-versa*). If the 'odd' sample is consistently picked five times in a 'blind test, the material shall be deemed to have a pattern of odour different from that of the standard sample.

APPENDIX A

(*Clause* 0.4.1)

LIST OF INDIAN STANDARDS ON SENSORY EVALUATION

IS : 5126 (Part 1) - 1969
Glossary of general terms for sensory evaluation of foods: Part 1 Methodology

IS : 5126 (Part 2) - 1969
Glossary of general terms for sensory evaluation of foods: Part 2 Quality characteristics

IS : 6273 (Part 1) - 1971
Guide for sensory evaluation of foods: Part 1 Optimum requirements

IS : 6273 (Part 2) - 1971
Guide for sensory evaluation of foods: Part 2 Methods and evaluation cards

IS : 7675 - 1975
Method for sensory evaluation of beer

IS : 7768 - 1975
Method for sensory evaluation of milk

IS : 7769 - 1975
Method for sensory evaluation of table butter

IS : 7770 - 1975
Method for sensory evaluation of *GHEE* (*Clarified butterfat*)

IS : 7997 - 1976
Guide for tasting of products of intense flavour

IS : 7999 - 1976
Tasting glass for liquid samples

IS : 8104 - 1976
Method for test for pungency of chillies by scoville heat units

IS : 8105 - 1976
Method for sensory evaluation of pungency of black pepper by scoville heat units

IS : 8140 - 1976
Guide for selection of panel for sensory evaluation of foods and beverages

IS : 8153 - 1986
Method for sensory evaluation of fresh fruits (*first revision*)

IS : 8639 - 1977
Code for evaluation of the effect of packaging and storage on the sensory qualities of foods and beverages

IS : 10029 - 1981
Methods for sensory evaluation of sweetened condensed milk

IS : 10030 - 1981
Methods for sensory evaluation of milk powders

IS : 10281 - 1982
Method for sensory evaluation of processed cheese

IS : 10641 - 1983
Recommended methods for determination of aroma and taste thresholds

IS : 10642 - 1983
General guidelines for consumer sensory evaluation of foods and beverages

IS : 10643 - 1983
Sensory evaluation procedure to establish guidelines for open dating processed food products

IS : 11582 - 1986
Method for sensory evaluation of pungency of ginger by scoville units

IS : 11583 - 1986
Method for sensory evaluation of Indian made foreign liquors (IMFL)

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Amendments Issued Since Publication

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